Studies on the Chironomid Species Collected with Light Trap in Sunaba, Kurobe, during the Winter Season from December to April, 2000

Hidefumi TANAKA and Manabu SASA

Institute of Environmental and Welfare Studies, Aramata 135-3, Kurobe-shi, 938–0001, Toyamaken, Japan

Abstract: Night collections of adult chironomid midges with a light trap were conducted during the winter season from December 1999 to April 2000, at intervals of about 2 weeks, in a garden of our laboratory surrounded by trees and located near a stream containing natural spring waters. The specimens were preserved in 70% ethanol medium, and were all individually mounted on slides following our routine methods. As the results, a total of 58 adult male specimens were examined and identified, and they were classified into 15 species, which included 3 new species. Although the numbers of specimens collected were very small, they included taxonomically interesting species which could not be found in the spring to autumn seasons when large numbers of chironomid specimens could be collected with the same method.

Key words: Chironomidae, Mediccal entomology, New species, Toyama

INTRODUCTION

Collections of chironomid midges have been conducted recently by a number of workders located in various regions of Japan, and very many new informations have been accumulated on the taxonomy, distribution and biology of this group of insects. However, most of these collections were conducted during spring, summer and autumn seasons when large numbers of the midges appear and become nuisances to the local people. Since we established our laboratory near the Japan Sea and close to the Kurobe River discharging abundant clean waters of Japan Alps, collections of the chironomids during nighttime with light traps and during daytime with insect nets have been conducted, and a part of the results, especially those referring to the abundant seasons, have been already published. This report deals mainly with the resuls of collections made during the winter season.

RESULTS

By the microscopic examination of slid-mounted specimens of the adult male chironomids collected with the light trap, the following numbers of the species were identified.

Received for publication, June 1, 2001

1. December 13:	*Euorthocladius kanii*	1 total 1
2. December 31:	*Euorthocladius kanii*	4
	Diplocladius cultriger	1 total 5
3. January 25:	*Euorthocladius frigidus*	1 total 1
4. January 31:	*Diplocladius cultriger*	1 total 1
5. February 8:	*Diplocladius cultriger*	1
	Euorthocladius kanii	1 total
6. March 2:	*Diplocladius cultriger*	1 total 1
7. March 12:	*Diplocladius cultriger*	2
	Euorthocladius kanii	2
	Orthocladius glabripennis	1
	Smittia aterrima	1
	Smittia sunababeceus sp. nov.	1 total 7
8. March 22:	*Smittia aterrima*	9 total 9
9. March 29:	*Chironomus samoensis*	1
	Diplocladius cultriger	1
	Eukiefferiella tanaflava	1
	Orthocladius chuzeseptimys	1
	Orthocladius glabripennis	2
	Orthocladius toyamakeleus	1
	Limnophyes tamakitanaides	1
	Smittia aterrima	1
	Pseudosmittia kurobeokasia	1
	Pseudodiamesa sunabacedea sp. nov.	1 total 11
10. April 10:	*Diplocladius cultriger*	3
	Cricotopus polyannulatus	1
	Euorthocladius kanii	1
	Orthocladius glabripennis	2
	Orthocladius toyamakeleus	2
	Smittia aterrima	6
	Psectrocladius sunabaabeus sp. nov.	4 total 19
11. April 25:	*Smittia aterrima*	1 total 1

Records of species collected, with taxonomical notes

1. *Chironomus samoensis* Edwards, 1928

A male was collected on March 29, No.350:23. WL 4.12 mm, AR 3.38, fLR 1.59.

2. *Diplocladius cultriger* Kieffer, 1908

Nine males, No.350:77, collected on December 31, No.86, on January 31, No.87, on February 8, No.89 on March 2, No.93,95 on March 12, and No.35,36,39 on April 10.

3. *Cricotopus polyannulatus* Tokunaga, 1936

A male, No.350:30, was collected on April 10. WL 2.01 mm, WW/WL 0.32, AR 1.24. Eyes pubescent, ER 1.07. .P/H 0.86. RR 0.48, VR 1.15, R/Cu 1.02. fLR 0.66, mLR 0.52, hLR 0.56.

4. *Euorthocladius frigidus* (Zetterstedt, 1852)

Two males, No.350:85 was collected on January 25, and No.350:91, on March 12. BL 5.36, 4.90 mm, WL 3.18, 3.04 mm, WW/WL 0.28, 0.30. Body almost entirely black. Eyes bare, inner margin strongly concave, ER 1.08, 0.79. Antenna with 13 flagellar segments, AR 2.50, 1.64. P/H 1.23, 1.02. SO 15:15, 20:20, CL 12, 14. Antepronotum unitted, 7:6, 12:8 lateral setae. DM 8, 16, all minute, DL 14:16, 18:119, PA 5:5, 6:9, SC 18, 28 (very many). Squama fringed, RR 0.34, 0.38, VR 1.10, 1.00, R/Cu 1.04, 1.06. fLR 0.82, 0.75, mLR 0.57, 0.49, hLR 0.59, 0.56, fTR 0.11, 0.13, fBR 2.4, 2.0, mBR 2.9, hBR 3.2. Pulvilli absent. Anal point long, narrow, nearly parallel-sided and apically rounded, with lateral setae, typical as a member of this genus. Inner lobes of gonocoxite double-layered, the dorsal lobe acutely angulate and the ventral lobe is obtuse. Gonostylus simple, without preapical swelling.

Remarks. From the above measurement data and structure, these specimens are considered as belonging to the species ***Euorthocladius frigidus*** described from Japan by Sasa & Okazawa (1992).

5. *Euorthocladius kanii* (Tokunaga, 1936)

Eight males were collected, No.350:01 oon December 13, No.350:74, 75, 78. 79 on December 31, No.350:88 on February 8, No.350:90 on March 12, and No.350:34 on April 10. BL 3.78-5.44 (4.64 in average of 8) mm, WL 2.48-3.36 (2.88) mm, WW/WL 0.28-0.32 (0.30). Scutal stripes and postnotum black, other scutal portions and scutellum yellow, legs and abdomen brown. Eyes bare, inner margin concave, ER 1.08-1.65 (1.28). Antenna with 13 flagellar segments, AR 1.60-2.50 (1.88), 0.64-0.69 (0.66). P/H 1.01-1.23 (1.16). SO 9-20 (14.4), CL 12-17 (13.5). Antepronotum united, with 5-8 (6.1) lateral setae. DM 0, except in a specimen (No.350:91) with 8 tiny setae are detectable. DL 9-16 (12.4), PA 4-7 (5.6), SC 18-46 (25.4) in 2 or 3 transverse rows. Squama with 16-26 (20.5) fringe hairs. Anal lobe strongly produced. RR 0.32-0.37 (0.34), VR 1.02-1.10 (1.07), R/Cu 1.02-1.06 (1.04). Cu2 nearly straight. fLR 0.75-0.82 (0.78), mLR 0.52-0.58 (0.56), hLR 0.57-0.62 (0.59), fTR 0.11-0.14 (0.13), fBR 2.4-3.0 (2.7), mBR 2.4-2.9 (2.7), hBR 3.2-5.4 (4.3). Pulvilli absent.

Abdominal tergites with many setae. Anal point long, narrow, parallel-sided and apically rounded, with lateral setae. Small virga present, composed of some 10 short codes about 16 μm long situated on a cup. Inner lobe of gonocoxite conspicuous, composed of two completely overlapping processes,, the dorsal one acutly angulate, the ventral one wider and obtuse. Gonocoxite with another basal lobe. Gonostylus simple, with broa swelling on distal half of inner margin.

Remarks. From the above structure and measurement data, these specimens are considered as belonging to ***Orthocladius (Euorthocladius) kanii*** **(Tokunaga, 1939)**. This

species was collected in large numbers at Toga, Toyama, and redescribed by Sasa (1992, p.117). The present specimens are highly variable in measurment data and larger in body size than in the specimens collected in Toga. These specimens are quite similar in structure and measurement data to the avobe species, ***E. frigidus***, and were separated only by the absence of DM setae on scutum.

6. *Orthocladius toyamakeleus* (Sasa, 1996)

Three males, No.350:25, collected on March 29, No.350:31, 32, on April 10. BL 4.44, 3.72, 3.94 mm, WL 2.36, 2.08, 2.16 mm, WW/ WL 0.31, 0.30, 0.29. Scutal stripes and postnotum brown, other scutal portions and scutellum yellow, legs and abdomen brownish yellow, generally paler than in ***Orthocladius*** species. Eyes bare, ER 0.94, 0.97, 0.89, AR 1.67, 1.40, 1.35, AHR 0.50, 0.50, 0.48, PH 0.93, 0.83, 0.79. SO 18:18, 12:12, 12:12, CL 11, 9, 10. Antepronotum united, with 6:8, 9:11, 8:8 lateral setae. DM 19, 20, 28, all minute, DL 16:16, 16:16, 16:18, all weak, short and arising in small pits, like in those of genus ***Cricotopus***. PA 6:6, 6:6, 5:5, SC 12, 9, 10, all well developed. Wing vanation typical as a member of genus ***Orthocladius***, squama with 12:14, 12:12, 16:14 fringe hairs, RR 0.35, 0.37, 0.33, VR 1.12, 1.13, 1.12, R/Cu 1.07, 1.05, 1.05. fLR 0.73, 0.72, 0.67, mLR 0.51, 0.52, 0.51, hLR 0.56, 0.59, 0.60, fTR all 12, fBR 1.5, 1.7, mBR 1.5, 1.8, hBR 2.0, 1.9. Anal point in the form typical as a member of subgenus ***Orthocladius***, virga small, gonocoxite with 3 inner lobes, the basal lobe small, the distal lobes are overlapping. Gonostylus not expanded apically, withtout preapical tooth.

Remarks. The above measurement data and the structure are almost coincident with those of ***Orthocladius toyamakeleus*** **Sasa, 1996**, recorded with specimens collected with a light trap at the side of a lake in the suburbs of Toyama City on Nov. 30 an Dec. 21, 1993.

7. *Orthocladius glabripennis* (Goetghebuer, 1921)

Four males, No.350:92, collected on March 12, No.350:18, on March 29, No.350:37, 38, on April 10. BL 5.68, 5.772, 4.48, 5.16 mm, WL 3.56, 3.30, 2.54, 2.88 mm, WW/WL 0.28, 0.27, 0.30, 0.28. Body almost entirely black or dark brown. ER 0.94, 0.72, 0.86, 0.94, AR 2.34, 2.57, 2.43, 2.29, AHR 0.70, 0.61, 0.65, 0.56, P/H 1.19, 1.18, 1.14, 1.11, SO 20:20, 16:16, 20:16, 16:16, CL 14, 18, 16, 19, PN no, 6:6, 6:6, 6:6, DM 12, 10, 10, 12, DL 12:12, 16:15, 12:11, 13:12, PA 4:4, 5:5, 4:4, 6:6, SC 12, 12 (in a single transverse row) and 19, 18 (in two transeverse rows), SQ 38:34, 32:34, 43:28, 29:29, RR 0.40, 0.37, 0.37, 0.39, VR 1.07, 1.03, 1.04, 1.05, R/Cu 1.06, 1.07, 1.08, 1.05, fLR 0.85, 0.78, 0.84, 0.78, mLR 0.46, 0.56, 0.58, 0.58, hLR 0.61, 0.61, 0.61, 0.61, 0.54, fTR 0.13, 0.13, 0.15, 0.13, fBR 2.6, 2.6, 2.5, 3.1, mBR no, 3.3, no, 3.4, hBR no, 4.1, no, 4.4. Structure of head, thorax, wings, legs, abdomen and hypopygium typical as members of the ***glabripennis*** group of subgenus ***Orthocladius***.

Remarks. The classification of this group of ***Orthocladius*** is difficult with adult males only, and among these 4 specimens No.37 and 38 have 19 and 18 scutellar setae in two transverse rows (as in ***O. chuzeseptimus***), and mLR is 0.46 in No.92 but 0.56-0.58 in the other 3 specimens. They are provisionally classified to ***O. glabripennis*** in wider sense.

8. *Psectrocladius (Monopsectrocladius) sunabaabeus* sp. nov.

Four males, No.350:26-29 were collected on April 10. Holotype: No.350:28. Paratypes: other 3 males. BL 4.90-5.34 (5.20 in average of 4) mm, WL 2.72-2.92 (2.80) mm, WW/WL all 0.28. Body almost entirely black. Head in Fig. 1 a. Eyes bare, inner margin strongly concave but widely apart from each other, ER 1.33-1.60 (1.42). Antenna with 13 flagellar segments, with a terminal seta, AR 1.62-1.78 (1.68), AHR 0.61-0.68 (0.63). P/H 0.92-1.04 (0.97). SO 16-24 (18.3), CL 8-14 (10.5). Antepronotum (Fig. 1 b) united, with 3-11 (6.0) lateral setae. Scutum and scutellum in Fig. 1 c. DM all 0, DL 24-37 (30.5, rather numerous), PA 8-13 (10.8), SC 20-22 (21.0).

Wing (Fig. 1 d) membrane highly granular, squama with 26-35 fringe hairs, anal lobe strongly produced, costa not extending beyond tip of R4+5, RR 0.45-0.63 (0.54), VR 1.07-1.15 (1.10), R/Cu 1.06-1.07. Cu2 nearly straight. Tip of fore tibia (Fig. 1 e) with a long spur, tip of mid tibia (Fig. 1 f) with two spurs, tip of hind tibia (Fig. 1 g) with a long and a short spur, and a comb composed of 16 free spines. f LR 0.66-0.69 (0.68), mLR all 0.42 (very small), hLR all 0.58, fTR 0.10-0.11 (0.11), fBR 2.3-2.8 (2.5), mBR 2.4-3.0 (2.6), hBR 1.8-3.4 (2.6). All legs with large brush-like pulvilli (Fig. 1 h).

Abdominal tergites with relatively large numbers of setae almostt evenly distributed. Hypopygium in Fig. 1 i. Anal point absent, but ninth tergite with a broad and rounded bearing numerous short setae. Virga (also in Fig. 1 j) small, lateral margin U-shaped, 28 μm long and 18 μm wide. Inner lobe of gonocoxite small but long and narrow. Gonostylus (also in Fig. 1 k) peculiarly shaped, stongly expanded apically, with both ventral and lateral expansions, and a horn-like apical process.

Remarks. This species is considered as belonging to the subgenus ***Monopsectrocladius*** Wuelker, 1956, since the general structure is an ***Orthocladius*** form but legs with large pulvilli and tip of mid tibia with two spical spurs, but is quite unusual as a member of this group in that wing membrane is granular, anal point is absent but ninth tergite with a broad and rounded lobe bearing many setae, gonostylus is conspicuously expanded apically and with an apical process.

9. *Pseudosmittia kurobeokasia* Sasa et Okazawa, 1992

A male, No.350:22, collected on March 29. BL 3.04 mm, WL 1.74 mm, WW/WL 0.33. Scutum, scutellum and postnotum dark brown, legs an abdominal tergites brown. Eyes bare, reniform, ER 1.46. Antenna with 13 flagellar segments, AR 0.78, AHR 0.38, apical seta absent. P/H 0.98. SO 1+5:1+5, CL 8. Antepronotum united, with 2:2 lateral setae. DM 0, DL 11:10, PA 3:3, SC 4.

Wing bare, smooth, brownish, squama bare, anal lobe nearly rectangular, costa not extended beyong tip of R4+5, RR 0.71, VR 1.38 (very high), R/Cu 1.05. Cu2 short and strongly curved. Tip of fore tibia with a long spur (42 μm), tip of mid tibia (Fig. 2 f) with two short spurs (18, 19 μm), tip of hind tibia with a long (44 μm) and a short (20 μm) spur, and a comb composed of 14 free spines. Pulvilli vestigial.

Abdominal tergites with relatively small numbers of setae, 12 on I to Ⅶ, and 16 on

Ⅷ, and those on Ⅱ to Ⅶ are arranged into 6 anterior and 6 posterior rows. Anal point small, longer than wide and situated in about center of nintth tergite, entirely clothed in microtrichia. Ninth tergite with a rounded posterior lobe bearing 20 short setae. Inner lobe of gonocoxite small and rounded. Ninth tergite has another low lobe posterior to it. Gonostylus widest at apex, without preapical swelling.

Remarks. This specimen belongs to the genus ***Pseudosmittia*** **Goetghebuer, 1932**, since eyes, wings and squamae are bare, Cu2 is strongly curved, DM is absent but scutum with a median hole beariing two tiny setae, and anal point is small and entirely clothed in microtrichia. However, it is unusual as a member of this genus in that tip of R4+5 is not proximal to tip of Cu1 but R/Cu is slightly larger than 1.0, and a small anal point entirely clothed in microtrichia, and the structure and measurement data are almost coincident with that of ***P. kurobeokasia*** **Sasa et Okazawa, 1992**, recorded from upstream sites of Kurobe River, Toyama.

10. *Smittia aterrima* (Meigen, 1818)

Ten males, No.96, collected on March 12, No.350:98, 99, on March 22, No.350:20, 33, collected on April 10, and No.350:40,41, 43-45, on April 25. Eyes pubescent, Cu2 strongly curved. Anal point narrow, rather small and almost entirely clothed in microtrichia. In No. 96, BL 3.22 mm, WL 1.96 mm, WW/WL 0.30, ER 1.48, AR 1.81, AHR 0.52, P/H 1.02, SO 8:8, CL 8, PN 3:2, DM 14, DL 13:12, PA 5:5, SC 8, SQ 0:0, RR 0.35, VR 1.26, R/Cu 1.06, fLR 0.53, mLR 0.47, hLR 0.60, fTR 0.11.

11. *Smittia sunababecea* sp. nov. (Figs. 2 a-j)

A male, No.350:94, collected on March 12. BL 4.58 mm, WL 2.22 mm, WW/WL 0.30. Scutum, scutellum and postnotum almost entirely black, legs and abdominal tergites dark brown. Head in Fig. 2 a. Eyes pubecent, reniform, ER 1.37. Antenna with 13 flagellar segments, with a prominent apical seta, AR 1.91 (very high), AHR 0.59. P/H 1.07. SO 10:10, CL 8. Antepronotum (Fig. 2 b) united, with 2:2 lateral setae. DM 14, DL 11:11, PA 4:4, SC 8 (Fig. 2 c).

Wing (Fig. 2 d) membrane bare, squama bare, costa extended much beyond tip of R4+5, RR 0.57, VR 1.37 (very high), R/Cu 1.04. Cu2 short and strongly curved. Anal lobe nearly rectangular. Tip of fore tibia (Fig. 2 e) with a long spur (56 μm), tip of mid tibia (Fig. 2 f) with two short spurs, tip of hind tibia (Fig. 2 g) with a long and a short spur, and a comb composed of 16 free spines. fLR 0.53, mLR 0.49, hLR 0.57, fTR 0.10, fBR 3.6, mBR 4.0, hBR 4.6. Pulvilli absent.

Abdominal tergites with relatively large numbers of setae. Hypopygium in Fig. 2 h. Anal point (also in Fig. 2 i) quite peculiarly shaped, relatively long and narrow, with a broadest base and tapering towards very fine and narrow tip, curved inwards and almost entirely clothed in microtrichia. Virga (Fig. 2 j) small, composed of 10 short codes situated on a cup. Inner lobe of gonocoxite (Fig. 2 k) braod and nearly rectagular. Gonostylus (Figs. 2 k,m) simple, widest at about middle, and without preapical swelling.

Remarks. This specimen has the basic structure typical as a member of genus ***Smittia* Holmgren, 1869**, but is quite unusual in the structure of anal point being tapering towards very fine and curved distal horn.

12. *Pseudodiamesa sunabacedea* sp. nov. (Figs. 2 a-i)

A male, No.350:24, was collected on March 29. BL 5.92 mm, WL 3.34 mm, WW/WL 0.30. Scutum and postnotum dark brown, scutellum, legs and abdominal tergites brown. Head in Fig. 3 a. Eyes highly pubescent, inner margin conspicuously concave, ER 0.87. Antenna with 13 flagellar segments, AR 1.43, AHR 0.52. P/H 1.15. SO 8:8, CL 18. Antepronotum (Fig. 3 b) united, bare dorsally, with 10:12 lateral setae. Scutum and scutellum in Fig. 3 c. DM 0, DL 12:11, PA 13, SC 31.

Wing (Fig. 3 d) bare, finely granular, without dark marks. Costa not extended beyond tip of R4+5. Cross vein M-Cu present. R2+3 simple, RR 0.32. VR 0.85, R/Cu 1.13. Tip of fore tibia (Fig. 3 e) with a long (102 *μm*) spur, tip of mid tibia (Fig, 3 f) with two spurs (78, 72 *μm*), tip of hind tibia (Fig. 3 g) with 2 spurs (96, 67 *μm*) and a comb composed of 18 spines. fLR 0.78, mLR 0.52, hLR 0.73, fTR 0.13, fBR 3.1, mBR 3.2, hBR 4.5. Tarsi Ⅳ cylindrical, nearly as long as tarsi Ⅴ. Pulvilli absent, claws with long basal setae.

Abdominal tergites with large numbers of short setae. Hypopygium in Fig. 3 h. Anal point (also in Fig. 3 i) very long, slender, 64 *μm* long and only 7 *μm* wide, nearly parallel-sided and apically pointed. Gonocoxite with two low and long inner lobes. Gonostylus simple, without preapical swelling.

Remarks. This specimen is considered as belonging to the subfamily Diamesinae, since wing with cross vein R-M and R2+3 is not forked, and to the genus ***Pseudodiamesa* Goethebuer, 1939**, as antepronotum bare dorsally, eyes produced dorsally, tarsi Ⅳ are cylindrical and almost as long as tarsi Ⅴ, and anal point is present. It is similar in structure to ***P. nivosa* (Goetghebuer)** among the species recorded from Europe as wing membrane is bare, but differs essentially from it since in ***P. nivosa*** gonostylus is thickened basally and inner lobe of gonocoxite is large and wide (Pinder, fig. 95A). Only one species, ***P. crassipilosa* (Tokunaga, 1937)** is recorded from Japan by female only.

Addendum

In addition to the above specimens collected with a light trap during the winter season, some chironomid specimens were collected with light traps or in the room of our house. Especially noteworthy are the specimens collected during nighttime on the desk of Sasa's office on June 22, 1999, which are classified as follows.

1. *Polypedilum arundineti* Goetghebuer, 1921 (1) No.350:58
2. *Rheotanytarsus kyotoensis* Tokunaga, 1938 (1) No.350:57
3. *Tanytarsus konishii* Sasa et Kawai, 1985 (1) No.350:56
4. *Tanytarsus oyamai* Sasa, 1979 (1) No.350:55
5. *Cricotopus trifasciatus* Edwards, 1929 (1) No.350:54

6. *Limnophyes minimus* (Meigen, 1818) (1) No.350:53
7. *Parakiefferiella* sp. "sunabadeea" (1) No.350:51
8. *Paratrissocladius* sp. "sunabaefeus" (1) No.350:52

Comments on the newly collected species.

The above two species (No.7 and 8) collected on the desk seem to be both new, but since antennae are lost, the scientific names will be given later when additional specimens are obtained in future.

***Parakiefferiella* sp. "sunabadeea" (Figs. 4 a,b)**

Specimen No.350:51, collected in a room in Sunaba. BL 2.24 mm, WL 1.32 mm, WW/WL 0.35. Antenna both lost. ER 1.43. SO 2:2, CL 8, PN 1:1, DM 0, DL 12:12, PA 3:3, SC 4. R2+3 in contact with R4+5, VR 1.55, R/Cu 0.94. hLR 0.56, hBR 6.3. Wing in Fig. 4 a, hypopygium in Fig. 4 b.

***Paratrissocladius* sp. "sunabaefeus" (Figs. 5 a,b)**

Specimen No.350:52, collected in a room in Sunaba. BL 2.92 mm, WL 1.78 mm, WW/WL 0.29. Antenna both lost. ER 1.00, P/H 1.24, SO 8, CL 8, PN 9:9, SQ 24, RR 0.60, VR 1.21, R/Cu 1.04, fLR 0.67, mLR 0.50, hLR 0.63, fTR 0.11, fBR 1.6, hLR 3.8. Wing membrane granular, venation in Fig. 5 a. Hypopygium in Fig. 5 b.

ACKNOWLEDGEMENTS

Thanks are due to Dr. Hiroshi Suzuki, Institute of Tropical Medicine, Nagasaki University, for kind assistances in editting and publishing this report, and to Miss Miyoko Takagi, who kindly assisted in the collection and examination of these specimens.

REFERENCES

References to the Chironomidae of Japan needed for identification of the above species are listed in the following two monographs.

1) Sasa, M. & Kikuchi, M. (1995): Chironomida of Japan. Univ. Tokyo Press. 333 pp.
2) Sasa, M. (1998): Chironomidae of Japan, 1998. Inst. Envir. Welf. Stud. 156 pp.

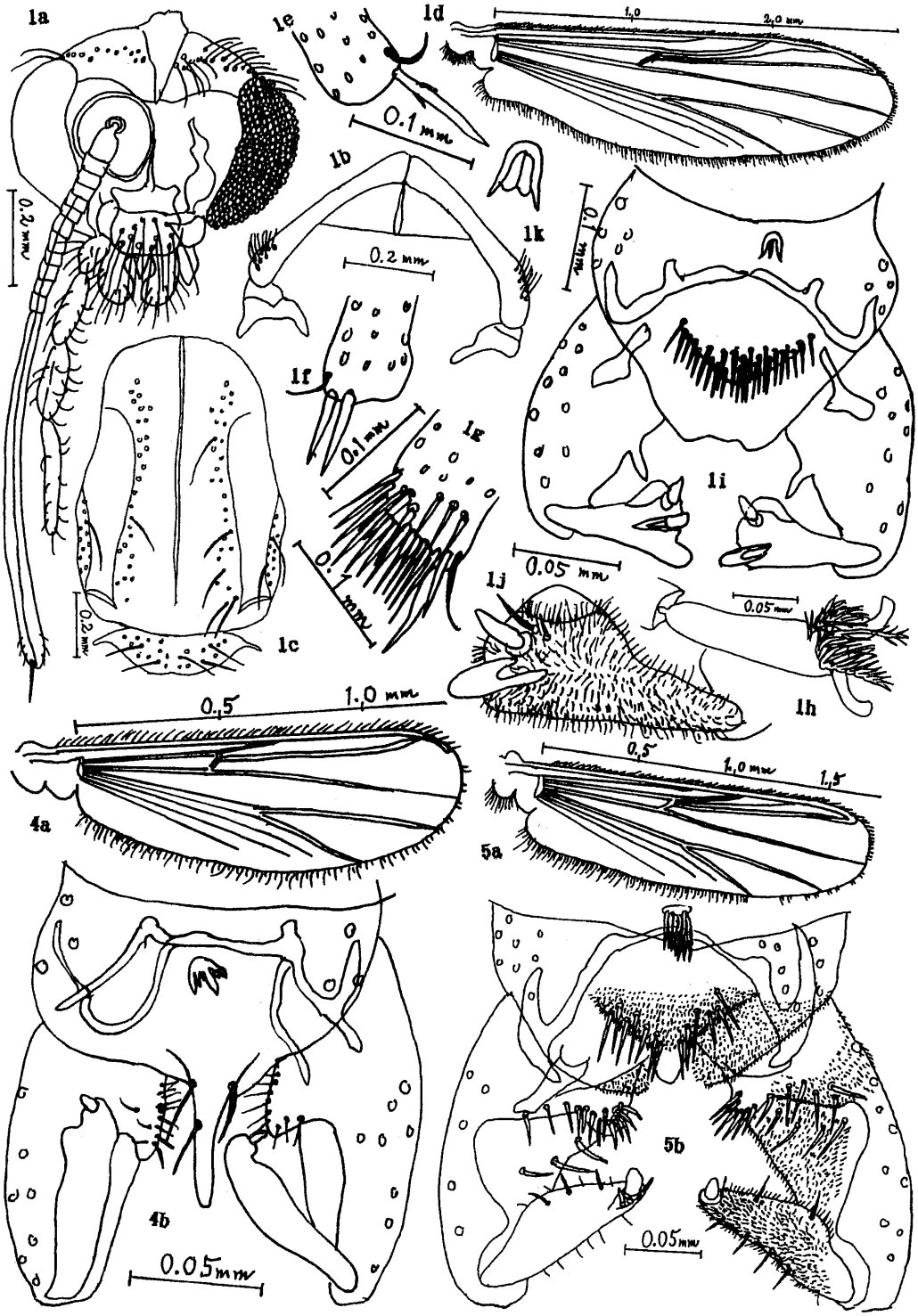

Plate 1. Figs. 1. *Psectrocladius sunabaabeus* sp. nov.
Figs. 4. *Parakiefferiella* sp. "sunabadeea"
Figs. 5. *Paratrissocladius* sp. "sunabaefeus"

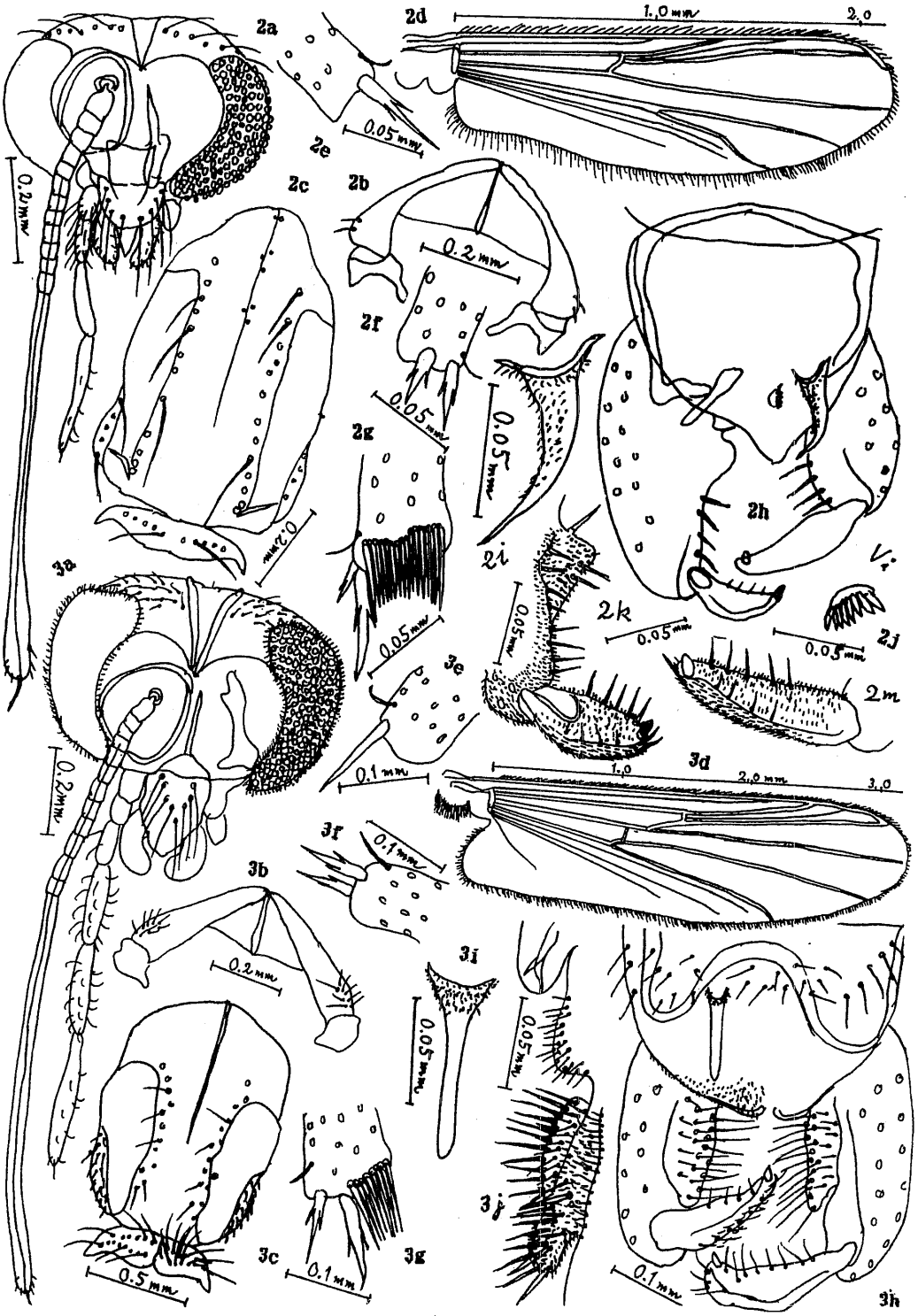

Plate 2. Figs. 2. *Smittia sunababecea* sp. nov.
Figs. 3. *Pseudodiamesa sunabacedea* sp. nov.